

In the Claims:Claim 1 (currently amended):

- 1 1. A method for making a series of nanoscale microstructures comprising the steps of:
 - 2 (1) forming a chiral block copolymer containing a plurality of first polymer blocks block
3 of first polymers and a plurality of second polymer blocks block of second polymers,
4 wherein at least said first polymer blocks are is a chiral polymer blocks exhibiting
5 chirality, and said first and second polymer blocks are capable of being subject to a
6 micro-phase separation and said first polymer blocks polymers have a volume
7 fraction ranging from 10 to 90%;
 - 8 (2) causing a microphase separation in said chiral block copolymer;
9 wherein said first polymer is poly(L-lactide) and said second polymer is selected from the
10 group consisting of polystyrene and poly(4-vinylpyridine), further wherein said chiral block
11 copolymer is poly(styrene)-poly(L-lactide) (PS-PLLA) chiral block copolymer when said
12 second polymer is polystyrene and poly(4-vinylpyridine)-poly(L-lactide) (P4VP-PLLA)
13 chiral block copolymer when said second polymer is poly(4-vinylpyridine).

Claim 2 (original):

- 1 2. The method for making a series of nanoscale microstructures according to claim 1, wherein
2 said chiral block copolymer is poly(styrene)-poly(L-lactide) (PS-PLLA) chiral block
3 copolymer, said first polymer is poly(L-lactide), and said second polymer is polystyrene.

Claim 3 (original):

- 1 3. The method for making a series of nanoscale microstructures according to claim 1, wherein
2 said chiral block copolymer is poly(4-vinylpyridine)-poly(L-lactide) (P4VP-PLLA) chiral
3 block copolymer, said first polymer is poly(L-lactide), and said second polymer is poly(4-

4 vinylpyridine).

Claim 4 (currently amended):

1 4. The method for making a series of nanoscale microstructures according to claim 1, wherein
2 said first polymer blocks polymers have a volume fraction ranging from about 20% to about
3 49%.

Claim 5 (original):

1 5. The method for making a series of nanoscale microstructures according to claim 1, wherein
2 said nanoscale microstructures are a series of helical microstructures.

Claim 6 (original):

1 6. The method for making a series of nanoscale microstructures according to claim 1, wherein
2 said nanoscale microstructures are a series of cylindrical microstructures each with a
3 hexagonal crosssection.

Claim 7 (previously presented):

1 7. The method for making a series of nanoscale microstructures according to claim 1, wherein
2 said poly(styrene)-poly(L-lactide) (PS-PLLA) chiral block copolymer is prepared using a
3 polymerization process comprising the following steps:

4 (1) mixing styrene with BPO and 4-OII-TEMPO to form 4-hydroxy-TEMPO-terminated
5 polystyrene; and

6 (2) mixing said 4-hydroxy-TEMPO-terminated polystyrene with L-lactide in an organic
7 solvent to form said poly(styrene)-poly(L-lactide) chiral block copolymer.

Claim 8 (original):

1 8. The method for making a series of nanoscale microstructures according to claim 7, wherein

2 said polymerization process is a living polymerization in which monomers are sequentially
3 added to a polymerization mixture.

Claim 9 (previously presented):

1 9. The method for making a series of nanoscale microstructures according to claim 1, wherein
2 said phase separation of said chiral block copolymer is achieved through crystallization.

Claim 10 (currently amended):

1 10. An object containing a series of repeating nanoscale microstructures formed in a substrate;
2 ~~said object~~ ~~being~~ ~~which is~~ formed using a process comprising the steps of:

3 (1) forming a chiral block copolymer containing a plurality of first polymer blocks block
4 of first polymers and a plurality of second polymer blocks block of second polymers,
5 wherein at least said first polymer blocks ~~are~~ is a chiral polymer blocks
6 exhibiting chirality, and said first and second polymer blocks are capable of being
7 subject to a micro-phase separation and said first polymer blocks polymers have a
8 volume fraction ranging from 10 to 90%;

9 (2) causing a microphase separation in said chiral block copolymer;

10 wherein said first polymer is poly(L-lactide) and said second polymer is selected from the
11 group consisting of polystyrene and pol(4-vinylpyridine), further wherein said chiral block
12 copolymer is poly(styrene)-poly(L-lactide) (PS-PLLA) chiral block copolymer when said
13 second polymer is polystyrene and poly(4-vinylpyridine)-poly(L-lactide) (P4VP-PLLA)
14 chiral block copolymer when said second polymer is pol(4-vinylpyridine).

Claim 11 (currently amended):

1 11. The object according to claim 10, wherein said block copolymer is a poly(styrene)-poly(L-
2 lactide) chiral block copolymer, and said first polymer blocks ~~are~~ is poly(L-lactide) blocks

3 and said second polymer blocks are is polystyrene blocks.

Claim 12 (currently amended):

1 12. The object according to claim 10 wherein said block copolymer is a poly(4-vinylpyridine)-
2 poly(L-lactide) chiral block copolymer, and said first polymer blocks are is poly(L-lactide)
3 blocks and said second polymer blocks are is poly(4-vinylpyridine) blocks.

Claim 13 (currently amended):

1 13. The object according to claim 10 wherein said first polymer blocks polymers have a volume
2 fraction ranging from about 20% to about 49%.

Claim 14 (previously presented):

1 14. The object according to claim 10 wherein said nanoscale microstructures are a series of
2 helical microstructures.

Claim 15 (previously presented):

1 15. The object according to claim 10 wherein said nanoscale microstructures are a series of
2 cylindrical microstructures each with a hexagonal crossection.

Claim 16 (previously presented):

1 16. The object according to claim 10, wherein said poly(styrene)-poly(L-lactide) (PS-PLLA)
2 chiral block copolymer is prepared using a polymerization process comprising the following
3 steps:

4 (1) mixing styrene with BPO and 4-OH-TEMPO to form 4-hydroxy-TEMPO-terminated
5 polystyrene; and

6 (2) mixing said 4-hydroxy-TEMPO-terminated polystyrene with L-lactide in an organic
7 solvent to form said poly(styrene)-poly(L-lactide) chiral block copolymer.

Claim 17 (previously presented):

17. The object according to claim 16 wherein said polymerization process is a living polymerization in which monomers are sequentially added to a polymerization mixture.

Claim 18 (previously presented):

1 18. The object according to claim 10 wherein said phase separation of said chiral block
2 copolymer is achieved through crystallization.

Claim 19 (canceled):

1 19. A nanoscale process comprising the steps of:

(1) obtaining an object, said object contains a series of nanoscale microstructures;

3 (2) wherein said nanoscale microstructures are formed using a process containing the
4 following steps:

6 (A) forming a block copolymer containing a plurality of first polymer blocks and
7 a plurality of second polymer blocks, wherein said first polymer blocks are
8 chiral blocks, wherein said first polymer blocks have a volume fraction
9 ranging from 20 to 49%;

(B) causing a phase separation in said block copolymer.

Claim 20 (cancelled):

20. The nanoscale process according to claim 19, wherein said block copolymer is a poly(styrene)-poly(L-lactide) chiral block copolymer, and said first polymer blocks are poly(L-lactide) blocks and said second polymer blocks are polystyrene blocks.

Claim 21 (canceled):

- 1 21. A method for making a series of nanoscale microstructures comprising the steps of:
- 2 (1) forming a chiral block copolymer containing a plurality of first polymer blocks of
3 first polymers and a plurality of second polymer blocks of second polymers, wherein
4 at least said first polymer blocks are chiral polymer blocks exhibiting chirality, and
5 said first and second polymer blocks are capable of being subject to a micro-phase
6 separation and said first polymer blocks have a volume fraction ranging from 10 to
7 90%;
- 8 (2) causing a microphase separation in said chiral block copolymer to self-assemble into
9 a series of nanohelical microstructures.

Claim 22 (canceled):

- 1 22. A method for making a series of nanoscale microstructures as claimed in Claim 22 wherein
2 said first polymer is poly(L-lactide).